List of most important tornadoes with special reference to cities that suffered severe damage or loss of life—Continued

Date	Place	For entire tornado			Authority	Remarks
		Killed	Injured	Property loss (estimated)		
1920, May 2	Peggs, Okla				Report, Chief of Wea. Bur., 1920-21, p. 37.	At Peggs: Killed, 60.
1921, Apr. 13	Melissa, Tex	11		$500,000	Report, Chief of Wea. Bur., 1921-22, p. 48.	All at Melissa.
1921, Apr. 15	Texas and Arkansas	61			Report Chief of Wea. Bur., 1921-22, p. 39, 49.	Loss in Arkansas $1,225,000.
1922, Apr. 17	Illinois, Indiana, and Ohio	16		900,000	Report, Chief of Wea. Bur., 1922-23, p. 33, 39.	Unusually long path.
1924, Apr. 30	Lawrenceville, Ga., to Hickory Grove, S. C.	10		2,200,000	Clim. Data, Georgia Sec., April, 1924; also South Carolina Sec., April, 1924.	Anderson, S. C., suffered severely.
1924, June 28	Lake Erie	85		12,000,000	Report, Chief of Wea. Bur., 1924-25; also Mo. Wea. Rev., 52: 309, 396.	At Sandusky: Deaths, 8; injured, nearly 100 loss about $1,000,000. At Lorain: Deaths, 73; injured, 200; loss, $11,000,000.
1924, July 13	Butler County, Kans	1		2,000,000	Clim. Data, Kansas Sec., July, 1924	Much damage in Augusta.
1925, Mar. 18	Missouri, Illinois, and Indiana	[1] 695	[1] 2,027	16,500,000	Clim. Data, Illinois Sec., Indiana Sec, Missouri Sec. March, 1925. See also, reports of American Red Cross.	Greatest of all tornadoes. Path unusually long. Property loss: Annapolis, Mo., $400,000; Gorham, Ill., $150,000; Murphysboro, Ill., $10,000,000; De Soto, Ill., $300,000; West Frankfort, Ill., $545,000; Griffin, Ind., $225,000; Princeton, Ind., $1,800,000. Missouri, $564,000; Illinois, $13,193,000; Indiana, $2,775,000. Gorham, De Soto, Parrish and Griffin were wiped out. Killed and injured, including all deaths that have occurred since the tornado (final American Red Cross figures): Gorham, Ill., and vicinity, 37 and 170; Murphysboro, Ill., and vicinity, 242 and 638; De Soto, Ill., and vicinity, 68 and 127; West Frankfort, Parrish, Ill., and vicinity, 181 and 455; Hamilton County, Ill. 36 and 98; White County, Ill., 29 and 42; Griffin, Ind., and vicinity, 25 and 202; Princeton, Ind., and vicinity, 45 and 152. Missouri, 13 and 63; Illinois, 606 and 1,563; Indiana, 76 and 401, respectively.

[1] Barron and Root traveled over the tornado track during the period two to ten days after the storm. At that time there was much confusion as to the number of killed and injured. The American Red Cross has prepared an accurate and authenic list of the killed and injured, including those who have died since the storm. Through the courtesy of Mr. Henry M. Baker, National Director of Disaster Relief, these figures are now available.—C. J. R.

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NOTES, ABSTRACTS, AND REVIEWS

AVALANCHE AT BINGHAM, UTAH

By J. CECIL ALTER

[Weather Bureau Office, Salt Lake City, Utah, March 5, 1926]

The snowslide which ran out of Sap Gulch into Bingham Canyon, stopping about 3 miles above Bingham town, Salt Lake County, Utah, at 9 a. m., February 17, 1926, demolished 14 miners' cottages and a 3-story frame boarding house, grouped near the mouth of the gulch, killed 36 persons and injured 13 others out of a total of about 65 who were in its path. Numerous other slides occurred about the same time in the mountains adjacent to Provo, Salt Lake City, and Ogden, though little additional damage or inconvenience resulted.

A comparatively heavy snowfall occurred during the afternoon and night of February 16, 1926, over the northern Wasatch Mountains, extending generally from eastern Juab to Cache Counties, inclusive. The depth of new snow averaged about 12 inches over the area mentioned, but averaged about 17 inches over Salt Lake County, ranging from 8 inches at Midvale (elevation 4,365) and 10 inches at Salt Lake City (elevation 4,300), to 27 inches at High Line City Creek (elevation 5,300) and 24 inches at Mountain Dell (elevation 5,500). Twelve or 15 inches fell over Sap Gulch watershed (elevation about 6,000 to 6,500)

The new snow was deposited on a general layer of crusted old snow in the mountains, and became unstable toward the end of the storm. Thus many of the better known snowslides ran, a few casting their avalanches which had not disgorged for a great many years. The Sap Gulch slide is reported to have run only twice in the past 30 years, and then with much smaller discharges. This latest slide seems to have started by the slipping of a large area of new snow, possibly aided by blasting in a surface mine not far distant.

Once started, the moving snow skidding over the glossy old snow, was augmented by contributions within and to the sides of its path, though it was also depleted by a large amount in a depression on the way down. No important hindrance was offered by trees or other objects in any part of its 2-mile path; and it gained a little speed as indicated in its leaping off a 100-foot ledge just above the destroyed buildings, clearing 50 feet of ground at the base of the ledge. However, no testimony was given by observers as to any extraordinary wind or air pressure; and other buildings near the end of the slide were not moved or damaged.

Survivors interviewed agree that there was a brief roaring sound, then a definite jiggling of the buildings as in a sharp earthquake, and then the crash of the avalanche. The buildings in the snow path were crushed like eggshells, most of them being swept along a few rods with the rolling, mixing avalanche. Most of the fatalities were instantaneous, though several persons were rescued alive and expired later. Most of the survivors were dug out of the débris at great effort, many of them after being imprisoned several hours. Some, however, were thrown free of harm, the outstanding escape being made by a man taking a shower bath, who though naked was carried 150 feet on the crest of the slide to safety.

The mass of moving snow, came to a stop a few yards below the group of buildings destroyed, the dead avalanche being about 800 feet long, 100 feet wide, and from 10 to 20 feet deep. All of this snow was carefully moved before it could be certain that it held no more bodies. Fortunately laboring men with proper tools were available in large numbers to effect the rescues as quickly as was humanly possible. Hospital service was also available

nearby for all the needy, in the first-aid rooms of the mining companies. The property loss is estimated at $40,000.

Three slides in Provo Canyon stopped rail and automobile traffic a few days; one slide at Ophir mining camp, Tooele County, ran at 1 a. m., February 17, demolishing two houses, one of them occupied by four persons who escaped; one slide at Alta, Salt Lake County, did little or no harm; and two slides in Mill Creek Canyon, this county, swept away some of the electric power line and robbed the power plants of water for a few hours; slides in Big Cottonwood and City Creek Canyons, this county, also dammed the streams temporarily, requiring the diversion of other waters into the Salt Lake City mains for a few hours; and two slides in Ogden Canyon blocked traffic several hours on the rail and automobile roads. The heavy snowfall in this storm delayed trains somewhat and hindered automobile traffic generally in the district, though all lines were soon open, and in a few days the valleys were bare.

GLACIER WATER UTILIZED IN CITY'S WATER SUPPLY

According to Engineering News-Record of March 4, 1926, the city of Boulder, Colo., has taken steps to purchase from the United States Government the land occupied by the Arapahoe glacier, distant about 15 miles from the city, with the object of supplementing the city's water supply therefrom. This is the first instance so far as known of a town or city in this country deriving a part of its water supply from a glacier.

PROVISIONAL SUN-SPOT RELATIVE NUMBERS, WOLFER, FOR 1925

[Reprinted from tables by A. Wolfer in Meteorologische Zeitschrift for April, July, October, 1925, and January, 1926]

1925	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	8		10	19	40	22	23	76			
2	0	19	8	8	23	83	28	22	59	62		62
3	7	17	7	7	35	92	39	26	80	55		
4	7	7?		14	35	80	47	0	73	54	17	64
5	0	8	0	19	31	94	66	8	60			67
6	0	8		17	43	73	50	23	71	35		
7	0			24	37	89	48	28	43	31		60?
8	0	38	0	21	34	118	61	40	38			80
9	0	32	0	31	43	114		56	65		39	56
10	0	40	0		39	109	43	70	47			
11	8	39	9			102	38	57	36			88
12	11	53	17	52		89	37	47	30	48		100
13		71	17	57	27	88	39	46	21	62		139
14	0			42	38	56	20	31	30			
15		49		35	47	35	21	7	42	87		
16		15?	20	31	47	17	41	7	60	96		157
17		31	28	42	78	8	40	7				136
18		12	34	35	83	13	31	10	51	109		132
19		26	32	60	70	7	28	28	60	57?		103?
20		13	24		69	0	35	24	67			137
21	11	11	17	40	74	0?	38	30	76	123		128
22				44	71	18	20	19	83	116		105?
23	8	13		36	54	14	0	31	77	98	124	111
24	8	14			39	7	16	30				
25		0			32	12	27		76	76	136	
26		7?			28	11	28	64	82	59		
27		0?	43		41	16	30	64	86	51	68?	
28	0	14	38	7	40	14	33	71	77	44		100
29	0		34	7	28	11	49	77	77	33		
30			24	16	26	17	34			29	62	84
31	0		22		17			92				91
Means	3.2	201.8	18.7	28.5	43.0	47.6	34.8	35.8	60.9	66.8	74.3	100.0

EVAPORATION IN VEGETATION AT DIFFERENT HEIGHTS

551.573

Mr. Frank C. Gates in the American Journal of Botany for March, 1926, pp. 167–178, presents the results of a study of the rates of evaporation encountered by plants at various heights above ground level under various weather conditions during 40 to 52 days during the season of greatest evaporation in the years 1917–1922 inclusive. Standard Livingston porous cup atmometers were used. The scene of the investigations was the Douglas Lake region of Cheboygan county, Michigan.

Looking over the results as a whole, it is plainly evident that there is always an increase in the rate of evaporation as one increases the height of the instrument above the ground. The wide range of values, however, also clearly shows that the local factors are of great importance in determining the actual magnitude of the increase. Likewise, the region and the time of year need consideration. In the present work the increase in height amounted to from 0.2 meter to 5.8 meters. The atmometers were maintained at the top of the crown in order to evaluate the conditions that the plants were meeting as they grew higher from the ground levels at which they started. The climatic variations in different years . . . account for a wide variation in values for any given spot. Aside from this fact, however, the greatest rates of increase were in the bog sets because the ground rate was there so distinctly low. Next came the marsh series and last the upland tree series . . .

An increase in evaporation was uniformly shown, even if the atmometer at the higher level was only 0.2 meter above the lower.

It appears that, in the crowns of the plants utilized, the increase is rapid at first but decreases with increase in height.

A plant meets conditions of increasing severity as it grows upward . . . In this region and in this series of experiments, this change in conditions has meant, under the conditions of experimentation, an increase of 6.06 c. c./m./day (to 4 meters) in pine groves; 3.55 c.c./m.day (to 6.1 meters) in aspen groves; 13.78 c. c./m./day (to 1.9 meters) in bogs; 10.56 c.c. /m./day (to 1.3 meters) in a bog-swamp; and 7.83 c.c. /m./day (to 1.1 meters) in marshes—all with white atmometers. With black atmometers the increases were 11.1 c. c./m./day (to 4.6 meters) in aspen groves, and 8.99 c. c./m./day (to 1.1 meters) in marshes.

WARMEST FEBRUARY AT LONDON IN 156 YEARS

February temperature was a record in England, and the observations at the Greenwich Observatory published in the Daily Weather Reports of the Meteorological Office and in the Weekly Returns of the Registrar-General show some exceptional results. The mean air temperature for the month at Greenwich was 45.7° F., which is the highest mean for London or Greenwich during the last 156 years; it is 6.9° above the monthly normal for the 150 years from 1770 to 1919, and in practical agreement with the normal for April. In this long series of years the February mean for 1869 was approximately in agreement with that for 1926, and the only other means of 45° or above were 45.3° in 1779 and 45.1° in 1872. There were two days, February 21 and 26, with the shade temperature above 60°, and there were 11 days with the temperature above 55°; there were 8 days with the temperature for the 24 hours 10° or more in excess of the normal, while the only days with the temperature below the normal were February 9 to 14. The minimum or night temperature was above 40° on 17 nights, and there were only two nights, February 13 and 14, with frost in the shade. On two days, February 22 and 26, the black-bulb thermometer in the sun's rays exceeded 100°, the respective readings being 106° and 111°, but the duration of bright sunshine for the month was small, registering only 1.3 hours a day on the average, while the normal is 2.0 hours. Separating the mean of 150 years into periods of 50 years, the means at Greenwich for February at 38.1° for 1770–1819, 39.0° for 1820–1869, 39.4° for 1870–1919; the mean for the 150 years is 38.8°. The normal for 35 years, 1880–1915, in general use by the Meteorological Office is 39.8°.—*Nature, March 13, 1926.*